

ACI at Shawville – Summary  
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Activated carbon injection was evaluated as a mercury control option for Reliant's Shawville Unit 3. The unit was equipped with two ESPs in series, each with an SCA less than 250 ft<sup>2</sup>/kacfm. Shawville Unit 3 fired an eastern bituminous coal with approximately 2% sulfur. Because of the potential for high flue gas SO<sub>3</sub> concentrations, the test program included an evaluation of lime injection to control SO<sub>3</sub> and perhaps increase the mercury removal performance of activated carbon. On-site CCS measurements indicated that baseline SO<sub>3</sub> concentrations at the ESP outlet were lower than expected, averaging about 1.7 ppm. Baseline vapor phase mercury removal across the ESPs was approximately 20%. Addition of activated carbon at 5 lb/MMacf decreased the SO<sub>3</sub> concentration to 1.1 ppm, demonstrating the reactivity of SO<sub>3</sub> with carbon. This carbon addition rate resulted in 35% vapor phase mercury removal across the ESP. Addition of lime (at a rate of 0.6 lb/hr/kacfm) upstream of the carbon injection point decreased the flue gas SO<sub>3</sub> concentration to less than 0.5 ppm, while increasing the mercury removal effectiveness of the activated carbon to 65%.